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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,314	02/26/2002	Fumio Isshiki	ASAM.0053	2802

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EXAMINER

GIESY, ADAM

ART UNIT	PAPER NUMBER
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2627

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/28/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/082,314

Applicant(s)

ISSHIKI, FUMIO

Examiner

Adam R. Giesy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5 and 7-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7,8,11 and 14-18 is/are rejected.
- 7) ☒ Claim(s) 9,10,12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/26/2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-5, 7, 8, 14, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (hereinafter Yoshida – US Doc. No. 2002/0024153 A1) in view of Sato (US Pat. No. 6,452,215 B1) and further in view of Kononenko (Asymmetric Multiple-Quantum-Well Heterostructures).

Regarding claim 1, Yoshida discloses an optical head comprising a light source for emitting a light beam (Figure 3, element 301), a lens for focusing the light beam onto a medium (element 302), and a detector for detecting a reflected light beam from the medium (311), the light source having an active layer that is an indirect semiconductor (see page 4, paragraphs 0040-0042). Yoshida fails to disclose that the laser has a barrier layer or that the semiconductor layer contains quantum wells.

Sato discloses a semiconductor laser comprising an active layer and a cladding (or barrier) layer wherein both layers are made of an indirect semiconductor (see abstract).

Kononenko discloses lasers wherein the semiconductor has an asymmetric quantum well structure in which band structures of a conduction band and a valence

band are left-right asymmetric with respect to a center of the quantum well structure in a band structure pattern (see page 1; see also page 4, Figure 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head device as disclosed by Yoshida with the active and barrier layers in the laser as disclosed by Sato and the asymmetric quantum well structures as disclosed by Kononenko, the motivation being to obtain a more easily tunable laser diode for use in reading from optical media.

Regarding claim 3, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Sato further discloses that the semiconductor laser has a cladding layer (read: barrier layer) which is also said indirect semiconductor (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head device as disclosed by Yoshida, Sato, and Kononenko with the barrier layer made of an indirect semiconductor as disclosed by Sato, the motivation being to produce a more intense and direct laser beam.

Regarding claim 4, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Sato further suggests that the indirect semiconductor is made of an indirect semiconductor mixed crystal material (see column 8, lines 8-21 – the term “lattice” refers to a crystalline lattice formation; see also column 3, lines 35-44).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head device as disclosed by Yoshida, Sato,

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and Kononenko with the indirect semiconductor made from a crystalline lattice as disclosed by Sato, the motivation being to produce a more intense and direct laser beam.

Regarding claim 5, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Yoshida further discloses that the optical head is used for reproducing information from the medium (see page 1, paragraphs 0004).

Regarding claim 7, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Sato further discloses that the indirect semiconductor has an adjacent confinement structure (see column 8, lines 61-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head device as disclosed by Yoshida, Sato, and Kononenko with the confinement structure as disclosed by Sato, the motivation being to produce a more intense and direct laser beam.

Regarding claim 8, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Sato further discloses that the indirect semiconductor is of an AlGaP (aluminum, gallium, and phosphor) group (see column 8, lines 59-67; see also abstract – the Examiner considers the AlGaInP layers to also be in the AlGaP group both materials contain aluminum, gallium, and phosphor).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head device as disclosed by Yoshida, Sato,

and Kononenko with the indirect semiconductor material as disclosed by Sato, the motivation being to produce appreciable d offsets.

Regarding claim 14, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Yoshida further discloses that a direct current (dc) drive is used for driving the semiconductor laser (page 6, paragraph 0061).

Regarding claim 18, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Yoshida further discloses an optical disc apparatus (page 3, paragraph 0024).

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (hereinafter Yoshida – US Doc. No. 2002/0024153 A1) in view of Sato (US Pat. No. 6,452,215 B1) and further in view of Kononenko (Asymmetric Multiple-Quantum-Well Heterostructures) and even further in view of Chapple-Sokol et al. (hereinafter Chapple – US Pat. No. 5,354,707).

Regarding claim 11, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Yoshida, Sato, and Kononenko all fail to distinctly disclose that the material of the indirect semiconductor is of a SiGe (silicon germanium) group.

Chapple discloses an indirect semiconductor structure in which the layers are made from the SiGe group (see column 3, lines 11-38 - read to be in the SiGe group).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head structure as disclosed by Yoshida, the

layering structure as disclosed by Sato, the asymmetric nature of the quantum well as disclosed by Kononenko, and the layer structure as disclosed by Chapple, the motivation being to produce a more intense and direct laser beam.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (hereinafter Yoshida – US Doc. No. 2002/0024153 A1) in view of Sato (US Pat. No. 6,452,215 B1) and further in view of Kononenko (Asymmetric Multiple-Quantum-Well Heterostructures) and even further in view of Hayashi (US Pat. No. 6,394,655 B1).

Regarding claim 15, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Yoshida, Sato, and Kononenko all fail to distinctly disclose that the optical head comprises a multi-layer film reflector provided at an end face of a resonator.

Hayashi discloses that a reflective film is formed at one end face of a resonator in his semiconductor laser (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head structure as disclosed by Yoshida, the layering structure as disclosed by Sato, the asymmetric nature of the quantum well as disclosed by Kononenko, and the film and resonator as disclosed by Hayashi, the motivation being to produce a laser with improved transmission speed.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (hereinafter Yoshida – US Doc. No. 2002/0024153 A1) in view of Sato (US Pat. No. 6,452,215 B1) and further in view of Kononenko (Asymmetric Multiple-Quantum-

Well Heterostructures) and even further in view of Momoo et al. (hereinafter Momoo - US Pat. No. 6,741,538 B2).

Regarding claim 16, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Yoshida, Sato, and Kononenko all fail to distinctly disclose that the optical head comprises a waveband pass filter for limiting the wavelength of the light beam from the semiconductor laser to be less a half-value width of 2 nm.

Momoo discloses a semiconductor laser system that uses a band-pass filter, in order to limit the reflection and transmission of the light by the wavelength (see column 1, lines 46-48 – this filter can be set to any wavelength for the best mode of operation).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head structure as disclosed by Yoshida, the layering structure as disclosed by Sato, the asymmetric nature of the quantum well as disclosed by Kononenko, and the band-pass filter as disclosed by Momoo, the motivation being in order to limit the reflection and transmission of the light by the wavelength.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (hereinafter Yoshida – US Doc. No. 2002/0024153 A1) in view of Sato (US Pat. No. 6,452,215 B1) and further in view of Kononenko (Asymmetric Multiple-Quantum-Well Heterostructures) and even further in view of Brown (US Pat. No. 5,625,729).

Regarding claim 17, Yoshida, Sato, and Kononenko disclose all of the limitations of claim 1 as discussed in the claim 1 rejection above. Yoshida, Sato, and Kononenko

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all fail to distinctly disclose that the optical head comprises a cooler for lowering the temperature of a light emitting part of the semiconductor laser.

Brown discloses a semiconductor laser with heat sinks or active coolers for lowering the temperature of the light emitting part of the laser during operation (see column 14, lines 20-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical head structure as disclosed by Yoshida, the layering structure as disclosed by Sato, the asymmetric nature of the quantum well as disclosed by Kononenko, and the cooler as disclosed by Brown in order to effectively avoid overheating the light emitting part of the laser.

Allowable Subject Matter

7. Claims 9, 10, 12, and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

See reasons for indicating allowable subject matter in the Office Action that was mailed on 4/4/2005.

Response to Arguments

8. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Furthermore, Applicant, on page 6 of the Remarks filed on 10/10/2006, argues that the Yoshida reference does not disclose a laser light source. The Examiner respectfully disagrees. Examiner would like to point out that Yoshida discloses that the prior art

(Figure 1) is an optical pickup device (also note that Figure 1, element 105 is an optical disc). Examiner would also like to cite that the Applicant admits, in the Remarks filed on 12/20/2005) that Yoshida shows an indirect semiconductor laser (see page 6 of the Remarks).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Lee et al. (Wide-Range Tunable Semiconductor Lasers Using Asymmetric Dual Quantum Wells) discloses the use of multiple sized quantum wells in order to make lasers more tunable.

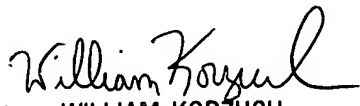
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam R. Giesy whose telephone number is (571) 272-7555. The examiner can normally be reached on 8:00am- 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R. Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ARG 12/18/2006




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